1. A collective thinking process about carrying capacity

The main questions raised by researchers and MPA managers associated to GIS HomMer concern the normativity and feasibility of the carrying capacity (CC) (fig. 1), in a context characterized by growth of multi-objectives protected areas with new governance models.

Fig. 1/ Main questions about CC (Survey, Sept. 2015: answers expressed in absolute value according to the profile of respondents).
1. Normativity: objectify or justify management decisions.
2. Feasibility: identification of thresholds or optimism.

2. An overview of this concept (meaning, advantages and disadvantages)

- CC is a concept derived from engineering, taken up by a wide range of scientific disciplines (agroforestry, biology, demography, ... ) (fig. 2).
- CC generally seeks to formalize the threshold means by means of numerical(s) beyond which one or more phenomena occur.
- There are many definitions of CC. They refer to different dimensions: physical, biological, ecological, social or economic.
- CC is a controversial concept because of its subjective and normative scope, inspired by Malthus.

3. An experiment to qualify the visitor experience (Sept-îles archipelago)

The systematic literature review highlighted four main categories of assessment (tab. 3).

<table>
<thead>
<tr>
<th>ASSESS</th>
<th>Conserved (naturality)</th>
<th>Ecosystem (biological)</th>
<th>Well being (tourist)</th>
<th>Sustainability (system)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analytical framework</td>
<td>K / Habitat</td>
<td>NPL / PRE</td>
<td>CC</td>
<td>CC</td>
</tr>
<tr>
<td>Benchmark referred</td>
<td>To exceed</td>
<td>Recreational</td>
<td>Protected</td>
<td>Recreational</td>
</tr>
<tr>
<td>Expression of results</td>
<td>Population size</td>
<td>Use levels</td>
<td>Use levels</td>
<td>Ratio =/n</td>
</tr>
<tr>
<td>Activities to regulate</td>
<td>None</td>
<td>Recreational areas, small to large areas</td>
<td>Protected areas, very small areas</td>
<td>Articulation</td>
</tr>
<tr>
<td>Study areas</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
</tbody>
</table>

In accordance with the management plan (Provost, 2015), and in agreement with the local stakeholders of the Sept-îles archipelago (natural reserve: LPO, Perros-Guirec Mairie, Conservatoire du littoral, maritime carriers), the visitor experience (well-being) was studied on Île aux Moines (Cavalié, 2018), where the experiment was modified in 2014 (Freytet, 2011).

The protocol tested (fig. 3) aimed to question the relationships between observed and perceived visitor levels, embodiment experienced and satisfaction expressed at the end of the visit.

![Fig. 3/ Protocol tested (June-September 2018)](image)

The visitor experience today seems nice, whatever the level of observed visitor (fig. 4).

This reference standard can help local stakeholders in their reflection about the sustainable valorization of heritage of the Sept-îles archipelago.

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REFERENCES


RECOMMENDATIONS
1. Assess CC only for clearly identified management objectives.
2. Assess CC in small areas.
3. Assess few dimensions simultaneously.
4. Associate the local stakeholders to the CC assessment process.
5. Consider the CC in the broader context of a territorial project, defined by the stakeholders.